

## NOTES ON A COLLECTION OF FISHES FROM HAINAN, OBTAINED BY PROF. S. F. LIGHT

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(Received July 28, 1925)

During the summer of 1922 Professor S. F. Light of Amoy University visited Hainan, a large offshore island of South China, in order to make a collection of birds, fishes and insects for the university. At Haiho and in the Kachek River he made an extensive collection of fishes, of which the marine forms were sent by him for identification to Dr. A. W. Herre of the Bureau of Science, Manila, and the brackish and fresh-water forms to the writer. The present paper contains a list of the species (53 in all) examined by the writer, with descriptions of the following two new genera and twelve new species.

### NEW GENERA

1. *Carassiodoides*

2. *Spinibarbichthys*

### NEW SPECIES

- |                                      |   |
|--------------------------------------|---|
| 1. <i>Clupanodon haihoensis</i>      | 2. <i>Aoria virgatus</i>                |
| 3. <i>Misgurnus punctatus</i>        | 4. <i>Carassiodoides rhombeus</i>       |
| 5. <i>Spinibarbus nigro dorsalis</i> | 6. <i>Spinibarbichthys denticulatus</i> |
| 7. <i>Pseudogobio kachekensis</i>    | 8. <i>Acanthorhodeus longispinnis</i>   |
| 9. <i>Rhodeus spinalis</i>           | 10. <i>Apocryptes maculatus</i>         |
| 11. <i>Rhinogobius punctatus</i>     | 12. <i>Rhinogobius hainanensis</i>      |

This collection shows that fresh-water fishes obtained in the Kachek River are essentially identical with those of the Chinese Mainland, most of the species showing affinities with Indian forms, and small marine fishes which occasionally enter brackish or fresh-water are identical with those of the East Indies. It is to be seen also that there exists some relationships between

fresh-water fishes of Hainan and Formosa, because two genera, namely, *Spinibarbus* and *Rasborinus*, which were recorded as peculiar to the latter locality, were found in the present collection.

Not only is this collection notable in containing so many interesting species which are new to science, but it is also valuable in raising the total number of Hainan fishes from five to fifty-five, after a lapse of twenty-three years from the time of G. A. Boulenger (1899), who described the following five from the interior of Hainan.

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|----------------------------------|---------------------------------|
| 1. <i>Coreoperca whiteheadi</i>  | 2. <i>Discognathus imberbis</i> |
| 3. <i>Gymnostomus lepturus</i>   | 4. <i>Barilius hainanensis</i>  |
| 5. <i>Opsariichthys platypus</i> |                                 |

The writer is indebted to the courtesy of Professor Light, through whose efforts he is able to examine such a fine collection of fishes from *terra incognita*.

Family ELOPIDAE

*Elops* Commerson

1. *Elops saurus* Linnaeus

Seven specimens from Haiho.

Family MEGALOPIDAE

*Megalops* Lacépède

2. *Megalops cyprinoides* (Brouss.)

Two specimens from Haiho.

Family CLUPEIDAE

*Harengula* Cuvier et Valenciennes

3. *Herengula fimbriata* (Cuv. et Val.)

Six specimens from Haiho.

Family DOROSOMATIDAE

*Anodontosoma* Bleeker

4. *Anodontosoma chacunda* (Cuv. et Val.)

Three specimens from Haiho.

*Dorosoma* Rafinesque

5. *Dorosoma nasus* (Bloch)

A single specimen from Haiho.

*Clupanodon* Lacépède6. *Clupanodon haihoensis* sp. nov.

Head 3.17 in length; depth 2.95; snout 4.50 in head; eye 3.85; interorbital space 3.85; pectoral 1.69; ventral 2.70; depth of caudal peduncle 3; D. 17; A. 26; P. 15; V. 7; fifty scales in lateral series, twenty in transverse series.

Body strongly compressed, rather deep, ovate, more or less tapering posteriorly; dorsal and ventral profiles arched; throat and belly sharp, margined with 30 scutes, terminating in sharp spine pointed backward, 18 scutes between throat and the root of ventral; head conical, scaleless, top bony; interorbital space depressed, almost smooth: snout triangular, rather short; eye space large, pointed anteriorly, eye except the pupil covered by an adipose eyelid; mouth subterminal, slightly oblique, its angle reaching below the anterior border of pupil; maxillary well developed posteriorly, reaching below the middle of orbit; lower jaw slightly projecting beyond the upper; teeth and gular plate none; gill-openings large, membranes free from isthmus; gill-rakers on first arch fine and slender, nearly as long as gill-filaments which are very slightly shorter and coarser than rakers.

Scales thin, deciduous, cycloid, outer border entire; a long, thin, pointed scale in the axil of ventral and pectoral; lateral line not present.

Origin of dorsal much nearer to tip of snout than base of caudal, fin moderately high anteriorly, last ray prolonged into a filament, scarcely reaching the end of anal; anal low and elongate; pectoral moderate, scarcely reaching the root of ventral; ventrals small, opposite the dorsal, inserted slightly behind the origin of dorsal; caudal deeply emarginate.

Color in alcohol bluish olive above, paler and silvery below; an obscure oval dark spot on shoulder; each scale with no brown spot; a dark blotch above the eye; outer part of dorsal and caudal dusky; rest of the fine whitish.

Total length 110 mm.

Habitat: Haiho (a single specimen).

Family ANGUILLIDAE

*Anguilla* Shaw

7. *Anguilla mauritiana* Bennett

One example from the Kacheck River near Kacheck.

Family SILURIDAE

*Aoria* Jordan

(Substitute for *Macrones* Duméril, preoccupied)

8. *Aoria virgatus* sp. nov.

Head 4,05 in length ; depth 3,84 ; snout 2,65 in head ; eye 3,60 ; interorbital space 2,56 ; pectoral 1,12 ; ventral 2 ; D. I, 7 ; A. 15 ; P. I, 6 ; V. 6.

Body elongate, tail slightly compressed, section in front of dorsal triangular, dorsal outline before the dorsal declined anteriorly ; upper jaw projecting beyond the lower ; mouth inferior, transverse, crescent-shaped ; lips thick, fleshy, distinct at the angle of mouth ; jaws with a broad band of villiform teeth ; barbels eight, two nasals, two maxillaries, and four mandibularies, barbels maxillary barbels the longest, reaching the root of pectoral, nasal nearly as long as the inner pair of mandibular barbel ; eye oval, slightly anterior, covered by a thin skin, orbital margin free ; nostrils remote from each other, the anterior in a short tube situated at the end of snout, the posterior in front of eye above, just behind the root of nasal barbel ; interorbital space broad, more or less convex ; gill-openings extend forward below the anterior border of orbit ; gill-membranes entirely separated.

Origin of dorsal much in advance of the tip of pectoral, with a pungent spine serrated behind, teeth directed downwards ; adipose dorsal low, opposite the anal, but much shorter ; pectoral broad, armed with a strong spine serrated internally ; ventrals rather short, scarcely reaching the origin of anal ; anal short, rather high, anterior ray the longest ; caudal peduncle short ; caudal fin strongly forked, tip of each lobe sharply pointed.

Body smooth, lateral line nearly straight, running along the middle of tail, very slightly decurved anteriorly.

Color in alcohol yellowish with fine black dots ; belly whitish ;

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top and sides of head maculated with black; a longitudinal, bluish black band along the lateral line, forked at the caudal base, each branch reaching the tip of caudal lobe; back with a broad band of black color, connected with lateral band before the dorsal; sides below the lateral line roughly maculated with black; dorsal fin yellowish white, with black base, outer margin black, spine and rays grayish; adipose dorsal yellow, anterior part black; the rest of fins yellowish gray and finely dotted with black.

Total length 88 mm.

Described from the largest specimen.

Habitat: the Kachek River, about 40 miles above Kachek. Two specimens besides the type, measuring 79 and 81 mm. were obtained from the type locality.

*Clarias Gronovius*

9. *Clarias fuscus* (Lacépède)

Two specimens from the Kachek River near Kachek.

Family COBITIDAE

*Misgurnus* Lacépède

10. *Misgurnus punctatus* sp. nov.

Head 6,5 in length; depth 6,5; D. 8; A. 7; P. 1,9; V. 6; width of head 1,64 in its length; snout 2,25 in head; eye 6; interorbital space 4,5; pectoral 1,56; ventral 2,40, scales about 140 in a lateral series.

Body elongate, cylindrical, tail compressed; head small, conical; snout rather long, obtusely pointed anteriorly; eye small, anterior and superior; mouth inferior; upper lip thick and smooth, external edge turned up, lower lip fleshy, more or less fringed; ten barbels, four belonging to mandible, inner mandibular pair rather long; nostrils close together, in front of eye, anterior nostril in a short tube; interorbital space convex; gill-openings lateral; gill-membranes joined to throat in front of the pectoral base.

Origin of dorsal much nearer to base of caudal than tip of snout, opposite the ventrals, inserted slightly in advance of the root of the latter; pectoral inferior, rather short; ventral exceedingly small, tip reaching half way to vent; anal short, entirely behind the dorsal;

caudal rather short, tip broadly rounded; caudal peduncle deep, its depth 1.28 in head.

Head naked; trunk covered with minute scales; lateral line obscure, running along the middle of tail. Color in alcohol dusky gray above, lower half whitish, sides, cheeks, opercles, and maxillary barbels finely speckled with black; pectorals and ventrals whitish; ventral fins with several rows of dark spots; base of the caudal above with no black spot.

Total length 132 mm.

Described from a specimen from the Kachek River.

Habitat: The Kachek River near Kachek (a single specimen).

Remarks: The present species differs distinctly from the common loach, *Misgurnus angulicaudatus*, in having sucker-shaped mouth, exceedingly short ventrals, and no black spot above the caudal base. Coloration of the two species also differs greatly, *Misgurnus punctatus* being finely speckled with black.

Family CYPRINIDAE

*Carassius* Nilsson

11. *Carassius auratus* (Linnaeus).

Five specimens from the Kachek River near Kachek. One small example from rice fields near Kachek. Most common in Hainan.

*Carassiooides* gen. nov.

Body compressed, rather high, dorsal outline triangular. Head short, rounded. Mouth subinferior, slightly oblique. Barbels four, slender and short. Pharyngeal teeth in two series, 4,1 or 2-1,4, those on the outer series strongly compressed, inverted cone-shaped, with narrow, oval grinding surface, inner series exceedingly slender, tip blunted. Dorsal fin elongate, with three spines, of which the third the strongest, serrated behind, eighteen branched rays, inserted opposite the ventral. Anal short, with three spines and five branched rays, third spine exceedingly strong, serrated behind. Caudal peduncle rather deep. Lateral line running along the middle of tail, nearly straight. Scales large, cycloid. Gill-rakers setiform, closely set.

Remarks: The present genus is a nearest relative of *Carassius*

Nilsson. Four barbels and two series of pharyngeal teeth are the characteristics of *Carassiodoides*, which distinguish it from *Carassius*.

12. *Carassiodoides rhombeus* sp. nov.

Head 3.55 in length; depth 2.20; D.III,18; A.III,5; P. 16; V. 9; snout 3.58 in head; eye 3.07; interorbital space 2.68; pectoral 1.26; ventral 1.13; thirty-one scales in the lateral line, seven scales between origin of dorsal and lateral line, seven scales between the latter and the middle of belly, five scales between lateral line and origin of ventral; pharyngeal teeth 4,1 or 2-4,1 or 2-1,4; gill-rakers 42.

Body compressed, rather high, rhomboidal, deepest at the origin of dorsal, dorsal profile triangular, nape very slightly fallen from the back, ventral profile rounded, not carinate; caudal peduncle rather deep, 1.97 in head; head small, subconic, top more or less convex; snout rather short, rounded, slightly overhanging the upper jaw; interorbital space broad, very slightly depressed; eye large, superior and anterior; mouth subinferior, slightly oblique, its angle reaching a vertical through posterior margin of nostril; lower jaw shorter than the upper; lips thin, entire; barbels four, rostral barbels minute, the maxillary nearly as long as the diameter of iris; nostrils close together, in front of eye above, anterior nostril in a short tube, the posterior provided with a membranous flap; outer series of pharyngeal teeth inverted cone-shaped, strongly compressed, grinding surface flat and concave, inner series exceedingly slender, not pointed, tip oval and concave; gill-rakers on first arch long, setiform, closely set.

Dorsal elongate and high, opposite the ventrals, inserted nearer tip of snout than base of caudal, first and second spines weak, the former minute, nearly one-third as long as the latter, third spine serrated behind, exceedingly strong, anterior ray the longest, nearly as long as head, outer margin of the fin broadly concave; pectoral rather slender, reaching beyond the base of ventral, which reaches the vent; anal short, spines similar to those of the dorsal, third spine much more stronger, serrated behind, anterior ray the longest, base of the fin with a scaly sheath; caudal rather deep, forked, each lobe sharply pointed.

Scales cycloid, large; lateral line nearly straight, running along the middle of the tail.

Color in alcohol dark gray above, paler and silvery below; postoperculum golden, mottled with black; dorsal and anal dusky, outer margin darker; pectorals and ventrals grayish; caudal gray, outer margin darker.

Total length 203 mm.

Described from the largest specimen from the Kachek River near Kachek.

Habitat: The Kachek River, Hainan. Four specimens.

*Cyprinus* Artedi

13. *Cyprinus carpio* Linnaeus

Three specimens from Haiho. Two specimens from the Kachek River near Kachek.

*Scaphesthes* Oshima

14. *Scaphesthes lepturus* (Boulenger)

1809. *Gymnostomus lepturus* Boulenger, Proc. Zool. Soc. London, p. 961, Pl. 69, fig. 1; Hainan.

Five specimens from the Kachek River near Kachek. One specimen from the Kachek River about 40 miles above Kachek.

All the specimens are essentially identical with Boulenger's original description and figure.

In establishing a new genus *Scaphesthes* (Annals Carnegie Museum Dec. 16, 1919, p. 208) the writer made the following remarks with regard to the present species: "Although there is no statement regarding the barbels, *Gymnostomus lepturus* Boulenger from Hainan seems to belong to the genus *Scaphesthes*, because of the peculiar shape of the mouth, large scales, and the absence of an osseous dorsal spine. The barbels of *Scaphesthes* are very small, and hidden beneath the labial fold. Therefore, they might have been overlooked by Boulenger." In examining the specimens from the type locality, the writer was able to affirm that his previous view was not incorrect. All examples from the Kachek River are provided with minute maxillary barbels entirely hidden beneath the labial folds.

Head 4,90 in length; depth 4; snout 2,7 in head; eye 3,37; interorbital space 2,45; D. 3,8; A. 3,5; P. 16; V. 1,9; 47 scales in lateral line, 8 between origin of dorsal and lateral line, 4 between the latter and the root of ventral, 6 between lateral line and the middle of belly; total length 167 mm. (largest example).

The present species is common in the Kachek River. But it is a poor food fish.

*Osteochilus* Günther

15. *Osteochilus brachynopterus* (Bleeker)

Head 4,45 in length; depth 3,50; D. 2,11; A. 2,6; P. 13; V. 8; snout 2,50 in head; eye 4; interorbital space 2; pectoral 1,05; ventral 1,11; depth of caudal peduncle 1,53; 33 scales in lateral line, 5 scales in an oblique series from the origin of dorsal to lateral line, 4 scales between the latter and the root of ventral, 5 scales between lateral line and the middle of belly; pharyngeal teeth 5,4, 2-2, 4,5; gill-rakers 6+22.

A single specimen from the Kachek River near Kachek (total length 115 mm.).

Identity of the present species is somewhat dubious, although it is essentially identical with the description and figure of *Osteochilus brachynopterus* which has been recorded as one of the peculiar fishes of Sumatra. Among the fresh-water fishes from Chengchu, Fokien, China, obtained by Prof. S. F. Light, the writer found twenty-nine specimens which are referable to the present species.

*Hemibarbus* Bleeker

16. *Hemibarbus labeo* (Pallas)

Two specimens from the Kachek River near Kachek.

*Capoeta* Cuv. et Val.

17. *Capoeta semifasciolata* Günther

A single specimen from rice fields near Kachek.

*Barbodes* Bleeker

18. *Barbodes paradoxus* (Günther)

Head 4,10 in length; depth 3,75; snout 2,75 in head; eye 2,75; interorbital space 2,75; pectoral 1,22; ventral 1,22; depth of caudal

peduncle 2,45; D. 3,8; A. 3,5; P. 17; V. 9; 40 scales in lateral line,  $6\frac{1}{2}$  scales between origin of dorsal and lateral line, 4 scales between the latter and the root of ventral, 6 scales between lateral line and the middle of belly. Sides are provided with five vertical bands of black color; nape with a black cross band. Total length 55 mm.

A single specimen from the Kachek River about 40 miles above Kachek. Agrees quite well with the Formosan specimens obtained by the writer.

*Spinibarbus* Oshima

19. *Spinibarbus nigrodorsalis* sp. nov.

Head 3,65 in length; depth 4,12; D. 3,9; A. 3,5; P. 18; V. 9; snout 3,08 in head; eye 4,60; interorbital space 2,65; depth of caudal peduncle 2,45; 24 scales in lateral line,  $3\frac{1}{2}$  scales between origin of dorsal and lateral line, 2 scales between the latter and the root of ventral, 3 scales between lateral line and the middle of belly; pharyngeal teeth 5,3, 2-2, 3,5; gill-rakers 3+8.

Body elongate, tail more or less compressed; head conical, top rather flat; snout obtusely pointed anteriorly, nearly twice as long as the diameter of eye; interorbital space broad, depressed; eye anterior and superior, with many mucous cavities below and behind; nostrils close together, in front of eye, anterior nostril in a short tube, with a thin fleshy flap; mouth low and oblique, its angle reaching a vertical through hind margin of posterior nostril; lower jaw slightly shorter than the upper, outer edge rather sharp; lips thin, the lower distinct only at sides; barbels four, the rostral slender, scarcely reaching the root of maxillary barbel; gill-openings moderate; gill-rakers short and fleshy.

Origin of dorsal nearer to tip of snout than base of caudal, one scale in advance of the root of ventrals, spines not osseous, smooth, first one minute, second nearly half as long as third, anterior ray the longest; a sharply pointed recumbent spine before the root of dorsal, its basal portion hidden beneath the scales; pectorals thoracic, reaching more than half way to ventrals; ventrals opposite the dorsal, with a semilunar scale between the roots; anal rather short and high, anterior ray the longest; caudal elongate, deeply forked.

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Body covered with large cycloid scales; lateral line slightly decurved anteriorly, running along the middle of tail.

Color in alcohol uniformly gray above, paler and silvery below, all the fins dusky, caudal somewhat darker; outer margin of the dorsal black.

Total length 166 mm.

Described from the largest specimen from the Kacheck River near Kacheck.

Habitat: The Kacheck River near Kacheck (two specimens). The Kacheck River about 40 miles above Kacheck (three small specimens measuring 50 to 74 mm.).

Remarks: The present species is very closely related to *Spinibarbus hollandi* from Formosa, differing from it in having less number of scales in lateral line. Number of scales in lateral line varies from 21 to 24.

*Spinibarbichthys* gen. nov.

Type. *Spinibarbichthys denticulatus* Oshima

Body elongate, slightly compressed. Abdomen rounded. Dorsal fin inserted behind the root of ventrals, with three osseous spines and nine branched rays, third spine serrated behind, very strong. Anal rather short, with five branched rays. Mouth inferior, horseshoe-shaped. Upper jaw more or less fringed internally; outer margin of lower jaw obtuse and naked. Barbels four. A recumbent spine in front of the origin of dorsal, hidden beneath the scales. Pharyngeal teeth 5,3, 2-2, 3, 5, slightly compressed with curved pointed tip. Scales moderate. Lateral line decurved, running along the lower part of tail.

Remarks: The present genus is very closely allied to *Mystacoleucus* Günther and *Spinibarbus* Oshima. It differs from the former in having the anal with smaller number of branched rays, and from the latter in having serrated dorsal spine.

20. *Spinibarbichthys denticulatus* sp. nov.

Head 4,30 in length; depth 3,30; D. III, 9; A. 3,5; P. 17; V. 10; snout 2,85 in head; eye 4,10; interorbital space 2,30; pectoral 1,16; ventral 1,23; depth of caudal peduncle 1,84; 28 scales in lateral line,

5 scales in an oblique series between origin of dorsal and lateral line, 3 scales between the latter and the root of ventral, 5 scales between lateral line and the middle of belly; pharyngeal teeth 5,3, 2-2, 3,5; gill-rakers 3+9.

Body elongate, slightly compressed; head rather small, conical, top slightly arched; snout obtusely pointed anteriorly; interorbital space broad, slightly convex; eye moderate, superior and anterior; nostrils close together, in front of eye above, anterior nostril in a short tube, with a thin fleshy flap; mouth inferior, arched, very slightly oblique, its angle scarcely reaching a vertical through anterior nostril; upper jaw protruding beyond the lower, outer edge fleshy, more or less folded longitudinally; outer border of the lower jaw naked, edge rounded; lips thin, lower lips continuous; barbels four, rostral barbel reaching the orbit, maxillary barbel scarcely reaching the hind border of orbit; pharyngeal teeth laterally compressed, rather high, tip sharply pointed and curved; gill-rakers slender, sharply pointed; gill-openings lateral, moderate, membranes united to isthmus.

Origin of dorsal nearer base of caudal than tip of snout, inserted behind the root of ventral, spines osseous and strong, first spine very short, second scarcely reaching the middle of the third, which is very strong and serrated behind; a recumbent spine before the root of dorsal, pointed forward, entirely hidden beneath the scales; pectorals thoracic, extending more than half way to ventrals; opposite the dorsal, its root in advance of that of the latter; anal rather short, anterior ray the longest, when depressed, reaching the root of caudal; caudal fin elongate, deeply forked, tip of each lobe sharply pointed.

Body covered with large cycloid scales; axil of the ventral fin with a sharply pointed elongate scale; lateral line slightly decurved, running along the lower part of tail.

Color in alcohol uniformly dark gray, somewhat paler below; all the fins fuscous.

Total length 204 mm.

Habitat: The Kachek River near Kachek (a single specimen).

*Pseudogobio* Bleeker21. *Pseudogobio kachekensis* sp. nov.

Head 4,25 in length ; depth 6,40 ; D. 2,8 ; A. 2,6 ; P. 13 ; V. 8 ; snout 2,4 in head ; eye 3, interorbital space 4,80 ; pectoral 1,09 ; ventral 1,26 ; 34 scales in lateral line,  $3\frac{1}{2}$  scales between origin of dorsal and lateral line, 2 scales between the latter and the root of ventral, 4 scales between lateral line and the middle of belly ; pharyngeal teeth 5-5 ; eleven gill-rakers on first arch.

Body elongate, quadrate, more or less compressed posteriorly ; head elongate, squarish, top rather flat ; snout rounded anteriorly, dorsal surface fallen from the interorbital space ; mouth inferior, suctorial ; upper jaw overlapping the lower ; upper lip fleshy, fringed, the lower continuous with the upper, much thicker, tuberculated, symphysis with a pair of fleshy knobs ; outer edge of lower jaw horny ; barbels two, maxillary, rather slender and fleshy ; eye large, superior, occupies the middle of head ; nostrils close together, in front of eye above, hind border of the anterior nostril with a cutaneous extension which entirely covers the posterior nostril ; teeth canine-like, slender ; gill-rakers short, roughly set ; gill-openings lateral, large, membranes separated.

Origin of dorsal much nearer to tip of snout than base of caudal, inserted in advance of the root of ventral, rather high, anterior ray the longest ; pectoral elongate, thoracic, reaching near to the root of ventral, inserted beneath the middle of dorsal ; ventrals reach to midway to the origin of anal ; anal short, anterior ray the longest ; caudal peduncle elongate ; caudal fin elongate, moderately forked.

Scales thin, cycloid ; lateral line very slightly decurved, running along the middle of tail.

Color in alcohol grayish above, paler below, back indistinctly maculated with black ; dorsal and caudal grayish ; the rest of fins whitish.

Total length 62 mm.

Described from a specimen from the Kachek River about 40 miles above Kachek.

Habitat : A single specimen from the Kachek River near Kachek. Two from the same river about 40 miles above Kachek.

Remarks: The present species distinctly differs from the hitherto known species of the genus *Pseudogobio* in having 34 scales in lateral line and 4 scales between lateral line and the middle of belly.

*Xenocypris* Günther

22. *Xenocypris davidi* Bleeker

Head 4,80 in length, depth 3,75; D. III, 7; A. 2,10; P. 17; V. 9; snout 2,90 in head; eye 3,5; interorbital space 2,7; pectoral 1,03; ventral 1,3; depth of caudal peduncle 1,84; 62 scales in lateral line, 11 scales between origin of dorsal and lateral line, 5 scales between the latter and the root of ventral, 8 scales between lateral line and the middle of belly. Total length 193 mm. (largest specimen). Four examples from the Kachek River about 40 miles above Kachek.

*Acanthorhodeus* Bleeker

23. *Acanthorhodeus longispinnis* sp. nov.

Head 4,35 in length; depth 2,3; D. III, 15; A. II, 12; P. 14, V. 8; snout 3,4 in head; eye 3,1; interorbital space 2,62; pectoral 1,3; ventral 1,54; depth of caudal peduncle 1,9; 37 scales in lateral line, 5 scales in an oblique series between origin of dorsal and lateral line, 4 scales between the latter and the root of ventrals, 6 scales between lateral line and the middle of belly; pharyngeal teeth 5-5; gill-rakers 8 on first arch.

Body rhomboidal, strongly compressed, deepest in predorsal region, dorsal and ventral profiles nearly equally arched; abdomen obtusely rounded; head small, compressed and triangular, dorsal outline nearly straight, slightly fallen from back; snout short, obtusely pointed anteriorly, more or less convex over surface; interorbital space broad, rather flat, bony; mouth subinferior, slightly oblique, horseshoe-shaped, its angle reaching a vertical through anterior border of nostril; upper jaw slightly longer than the lower; lips thin; barbels two, maxillary, exceedingly short; eye large, anterior and lateral; nostrils close together, large, anterior nostril in a short tube, which is provided with cutaneous posterior extension covering posterior nostril; gill-openings lateral,

membranes united to isthmus below the angle of preoperculum; pharyngeal teeth laterally compressed, with incurved, pointed tip, inner edge serrated; upper limb of first gill arch with no rakers, gill-rakers slender and pointed.

Origin of dorsal slightly nearer to base of caudal than tip of snout, spines strong, osseous, first one minute, second reaching the middle of the third, anterior ray the longest, base of the fin one and half times as long as head; pectoral slender, extending beyond halfway to ventrals; origin of ventrals well before that of the dorsal, reaching far beyond the vent; anal inserted below the anterior one third of the base of dorsal, its base a trifle more than head, dorsal and anal equally extend backward, but not reaching the base of caudal; caudal fin deeply forked.

Scales thin and cycloid, more or less rhomboidal; lateral line complete, slightly decurved, running along the lower part of tail, entering the middle of caudal base.

Color in alcohol grayish above, paler below; no dark spot on shoulder; side with a narrow black stripe, beginning at the second dorsal ray below and one scale above the lateral line, and extending backward near to the caudal base; each scale finely dotted with black; dorsal and caudal grayish, the former with two longitudinal pale bands; anal grayish; pectoral and ventrals whitish.

Total length 88 mm.

Described from the largest specimen from Kachek, Hainan.

Habitat: The Kachek River near Kachek (seven specimens).

Remarks: Number of branched ray of dorsal and anal as well as scales in lateral line are variable as shown in the following table:

D.	A.	P.	V.	Scales.
III, 15	II, 12	14	8	5-37-4
III, 15	II, 13	14	8	5-35-4
III, 14	II, 13	14	8	5-35-4
III, 16	II, 13	14	8	5-35-4
III, 16	II, 14	14	8	5-35-4
III, 15	II, 13	14	8	5-35-4
III, 16	II, 13	14	8	5-36-4

The present species is very closely allied to *Acanthorhodeus taenianalis* Günther from Shanghai, differing from it in having two maxillary barbels.

*Rhodeus* Agassiz

24. *Rhodeus spinalis* sp. nov.

Head 4,13 in length; depth 2; D. II, 10; A. II, 14; P. 13; V. 8; snout 3 in head; eye 3; interorbital space 3; pectoral 1,25; ventral 1,50; depth of caudal peduncle 1,88; 34 scales in lateral series, 5 scales between origin of dorsal and lateral line, 4 scales between the latter and the root of ventral, 6 scales between lateral line and the middle of belly; pharyngeal teeth 5-5; gill-rakers 3+8.

Body rhomboidal, strongly compressed, deepest in front of the origin of dorsal, dorsal and ventral profiles equally arched, top of head slightly fallen from the back; head small, conical and slightly compressed, top more or less depressed; snout short, dorsal surface swollen, obtusely pointed anteriorly; interorbital space rather broad, bony and depressed; mouth subinferior, small, its angle reaching a vertical through anterior border of nostril; upper jaw slightly longer than the lower; lips thin; nostrils close together, in front of eye above, anterior nostril round, in a short cutaneous tube, posterior nostril oval, much larger than the former; eye large, lateral and anterior; teeth laterally compressed, with sharply pointed incurved tip, sides smooth; barbels none; gill-openings lateral; gill-membranes united to isthmus at the posterior angle of preoperculum below.

Origin of dorsal midway between tip of snout and the base of caudal, spines rather strong, osseous, first spine reaching far beyond the middle of second, anterior ray the longest, fin high, its base slightly longer than head; pectoral slender, reaching more than half way to ventrals; ventrals inserted in advance of the origin of dorsal, scarcely reaching the anal; anal fin rather high, inserted below the anterior two-fifths of the base of dorsal, spines osseous, the second much stronger, soft rays slightly decreasing in length posteriorly, extending farther backward than the dorsal; caudal fin deeply forked, tip of each lobe sharply pointed.

Scales thin, cycloid; lateral line incomplete, visible only on seven or eight scales near gill-openings.

Color in alcohol grayish above, paler and silvery below, sides of tail with a median longitudinal streak of black color, disappearing at the origin of anal above; vertical fins dusky; pectorals and ventrals whitish.

Total length 78 mm.

Described from the largest specimen from the Kachek River near Kachek.

Habitat: Kachek River near Kachek (five specimens).

Remarks: Formula of scales and number of soft rays of dorsal and anal fins are variable as shown in the following table.

D.	A.	P.	V.	Scales.
II, 10	II, 14	13	8	5-34-4
II, 11	II, 14	13	8	5-32-4
II, 12	II, 14	13	8	5-33-4
II, 11	II, 15	13	8	5-32-4

The present species is very clearly distinguished from the hitherto known forms of *Rhodeus* by the presence of osseous dorsal and anal spines and by the anal with numerous soft rays.

#### *Zacco* Jordan et Snyder

##### 25. *Zacco platypus* (Temminck et Schlegel)

One specimen from Haiho. Two specimens from Kachek. Five specimens from the Kachek River about 40 miles above Kachek. The present species seems to be common in the Kachek River.

#### *Rasborinus* Oshima

##### 26. *Rasborinus takakii* Oshima

Five specimens from the Kachek River near Kachek. They are essentially identical with the type obtained in Formosa. Largest example (85 mm.) measures:—head 4,00 in length; depth 3,45; D. 2,7; A. 3,16; P. 15; V. 7; snout 3,3; eye 3,3; interorbital space 2,55; scales 7-38-4; postventral part of abdomen carinated.

*Chanodichthys* Bleeker27. *Chanodichthys stenzi* Popta

1907. *Chanodichthys stenzi* Popta, Zool. Anz. Bd. 32, p.  
246; Kaiserkanal, Kiauchau.

Three specimens from the Kacheck River near Kacheck. All the characters agree quite well with the original description of *Chanodichthys stenzi*. One of the examples measures:—head 4,10 in length; depth 3,55; D. II, 7; A. 3,28; P. 17; V. 9; snout 3,34 in head; eye 3,34; interorbital space 2,85; scales 11–53–8, five scales between lateral line and the root of ventrals; total length 170 mm.

28. *Chanodichthys affinis* Vaillant.

1892. *Chanodichthys affinis* Vaillant, Comp. rend. hebd.,  
Acad. Sc., t. 94, p. 127; Indo-China.

Head 4,10 in length; depth 3,55; D. II, 7; A. 2,23; P. 17; V. 9; snout 3,65 in head; eye 2,5; interorbital space 3,65; 48 scales in lateral line, 8 scales between origin of dorsal and lateral line, 4 scales between the latter and the root of ventrals, 6 scales between lateral line and the middle of belly; total length 102 mm. (a specimen from the Kacheck River near Kacheck).

Four others were collected in the same river about 40 miles above Kacheck. They are essentially identical with the original description of *C. affinis* given by Vaillant.

*Hemiculter* Bleeker29. *Hemiculter hainanensis* (Boulenger)

1899. *Barilius hainanensis* Boulenger, Proc. Zool. Soc.  
London, p. 961, pl. 69, fig. 2; Hainan.

Fifteen specimens from Kacheck and two from the Kacheck River about 40 miles above Kacheck.

Their characters agree quite well with the description and figure of Boulenger's *Barilius hainanensis*. The present species is provided with a deeply decurved lateral line and its abdomen is strongly compressed, postventral part being carinated. These are the generic characters of Bleeker's *Hemiculter* and not of *Barilius*. According to Günther and Day, abdomen of *Barilius* is rounded

and its lateral line slightly concave. It is reasonable, therefore, to change the generic name of the present species into *Hemiculter*.

*Culter* Basilewsky

30. *Culter brevicauda* Günther

Five specimens from the Kacheck River near Kacheck. One of them measures : head 4,57 in length ; depth 3,95 ; D. II, 7 ; A. 3,28 ; P. 15 ; V. 9 ; snout 4,22 in head ; eye 4,22 ; interorbital space 4,75 ; pectoral 1 ; ventral 1,26 ; 65 scales in lateral line, 11 scales between origin of dorsal and lateral line, 6 scales between the latter and the root of ventrals, 9 scales between lateral line and the middle of the belly ; total length 211 mm.

Family POECILIDAE

*Oryzias* Jordan et Snyder

31. *Oryzias latipes* (Temminck et Schlegel)

Three specimens from the rice fields near Kacheck.

Family MUGILIDAE

*Mugil (Artedi)* Linnaeus

32. *Mugil carinatus* (Ehrenberg)

Seven examples from Haiho.

33. *Mugil nepalensis* Günther

A single specimen from Haiho. Francis Day united the present species with *Mugil dussumieri* Cuv. et Val. in his "Fishes of British India." The writer believes, however, that the two are distinct species.

Family CARANGIDAE

*Caranx* (Lacépède) Bleeker

34. *Caranx forsteri* (Cuv. et Val.),

Two specimens from Haiho and six from the Kacheck River near Kacheck.

Family AMBASSIDAE

35. *Ambassis gymnocephalus* (Lacépède)

Four specimens from the Kacheck River near Kacheck.

Family SERRANIDAE

*Lates* Cuv. et Val.

36. *Lates calcarifer* (Bloch)

A single specimen from the Kachek River near Kachek.

Family SPARIDAE

*Sparus* Linnaeus

37. *Sparus datnia* (Hamilton)

One example from Kachek.

Family GERRIDAE

*Gerres* (Cuvier) Quoy et Gaimard

38. *Gerres punctatus* Cuv. et Val.

Three specimens from the Kachek River near Kachek.

39. *Gerres poeti* Cuv. et Val.

Five specimens from the Kachek River near Kachek.

40. *Gerres limbatus* Cuv. et Val.

Two specimens from the Kachek River near Kachek.

Family OPHICEPHALIDAE

*Ophicephalus* Bloch

41. *Ophicephalus maculatus* Lacépède

One large specimen measuring 280 mm. and a small young form from the Kachek River near Kachek.

42. *Ophicephalus gachua* Hamilton

Two young examples from the Kachek River near Kachek. Head 2,95 in length ; depth 6,42 ; D. 31 ; A. 21 ; snout 4,8 in head ; eye 6 ; interorbital space 3,45 ; scales 3-39-7.

Family LABYRINTHICI

*Polyacanthus* (Kuhl) Cuvier

43. *Polyacanthus operculatus* (Linnaeus)

Thirteen specimens from the rice fields near Kachek.

*Anabas* Cuvier

44. *Anabas scandens* (Daldorff)

Five specimens from Haiho.

Family GOBIIDAE

*Bostrichthys* Duméril

45. *Bostrichthys sinensis* (Lacépède)

Two specimens from Haiho.

*Eleotris* (Gronow) Schneider

46. *Eleotris oxycephala* Schlegel

One specimen from Haiho. Two from the Kacheck River near Kacheck.

*Glossogobius* Gill

47. *Glossogobius grammepomus* (Bleeker)

Seven specimens from the Kacheck River near Kacheck.

48. *Glossogobius brunneus* (Schlegel)

Five specimens from the Kacheck River near Kacheck.

*Apocryptes* Osbeck

49. *Apocryptes maculatus* sp. nov.

Head 4,05 in length; depth 5,5; eye 4,75 in head; snout 2,72; interorbital space 9,5; D. 6,14; A. 14; P. 18; V. 1,5; about 50 scales in a lateral series, 12 scales between origin of soft dorsal and anal; branchiostegals 3.

Body elongate, compressed, tapering posteriorly; head rather small, rounded anteriorly; snout short, blunt; interorbital space very narrow; eyes moderate, not prominent, directed obliquely upward; mouth subinferior and oblique, lower jaw slightly projecting beyond the upper; maxillary reaching a vertical through anterior margin of orbit; teeth in a single row in both jaws, fixed and conical, a few minute conical teeth directed backward above mandibular symphysis; gill-openings not extending far forward; gill-membranes united to isthmus; nostrils separated, anterior minute, in a short tube, posterior nostril triangular, situated midway between tip of snout and eye.

Dorsal separate, though close together, spinous dorsal more or less higher than soft dorsal, spines weak and with filamentous terminations, soft dorsal rather long, rays subequal in length, last one reaches beyond the base of caudal; a membranous crest before the spinous dorsal, which extends forward to occiput; pectoral with muscular base, tip reaches to vent; ventrals completely united, not adnate to the belly; anal elongate, slightly lower than soft dorsal, last ray reaching beyond the base of caudal; caudal fin lanceolate, elongate.

Head naked, body covered with regular cycloid scales, which become larger posteriorly; scales on nape exceedingly small.

Color in alcohol grayish above, paler below; head uniformly grayish white; scales on back with a minute black spot at the tip; eight or nine irregular dark bands pass from back half way down the sides; six V-shaped dark bands on the sides; all the fins grayish; dorsal and upper half of caudal finely spotted with dark.

Total length 105 mm.

Described from a specimen from Haiho.

Habitat: Haiho (9 examples).

Remarks: Differs from the allied forms of *Apocryptes* in having soft dorsal with a small number of rays.

*Rhinogobius* Gill

50. *Rhinogobius punctatus* sp. nov.

Head 3.56 in length; depth 4.85; D. 6,11; A. 10; P. 17; V. 15; snout 2.72 in head; eye 3.80; interorbital space 9.50; depth of caudal peduncle 1.90; about 26 scales in a lateral series, 10 scales between origins of soft dorsal and anal.

Body elongate, more or less compressed posteriorly; caudal peduncle deep; head long, dorsal contour rounded; snout short, blunt; eye superior, and anterior; interorbital space narrow, depressed; nostrils widely separated, the anterior in a short tube, the posterior in front of eye; mouth moderate, slightly oblique, its angle reaching to a vertical through the posterior nostril; lower jaw slightly projecting beyond the upper; tongue quadrate, truncated in front; both jaws with a single series of fixed pointed teeth and a band of villiform teeth behind them, lower jaw with

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lateral recurved canine teeth; gill-openings extending upward to upper edge of base of pectoral; gill-membranes united to isthmus; gill-rakers small, knob-like, 3+9 on first arch.

Dorsal fin well separated, spinous dorsal rather short, not higher than soft dorsal, spines not filamentous, when depressed, scarcely reaching the root of soft dorsal, soft dorsal elongate, rays subequal in length, not reaching the base of caudal; anal opposite the soft dorsal, inserted below the base of third ray of the latter; caudal quadrate, tip broadly rounded; pectorals acutely rounded, elongate, scarcely reaching the vent; ventrals completely united.

Head entirely naked; muscular base of pectoral smooth; scales ctenoid, large and regular, five lateral series in caudal peduncle; scales on breast anterior to ventrals cycloid and thin, firmly adherent to skin.

Color in alcohol pale grayish white, sides with five conspicuous brownish black spots, last one on the base of caudal and somewhat darker; back with six cross bands of the same color, passing half way downwards on sides; a black round spot above the root of pectoral; head uniformly gray, cheek and opercle somewhat paler; pectorals, soft dorsal and caudal uniformly gray; spinous dorsal with two longitudinal series of black spots; anal grayish, outer margin darker; ventrals dark gray.

Total length 87 mm.

Described from a specimen obtained at Haiho.

Habitat: Haiho (six specimens).

Remarks: The nearest relative of the present species is *Rhinogobius giurinus* from Swatow and Formosa.

### 51. *Rhinogobius hainanensis* sp. nov.

Head 3.90 in length; depth 4.59; depth of caudal peduncle 7.8; eye 4 in head; snout 3.35; interorbital space 4; maxillary 2.65; D. VI-11; A. 11; P. 15; scales in lateral series 50, in transverse series 11.

Body elongate, slightly compressed posteriorly, deepest at the origin of spinous dorsal; head rounded in profile, rather short and narrow; snout short, rounded; eyes small, situated high up, anterior, directed laterally; mouth slightly oblique, its angle

scarcely reaching a vertical through the middle of orbit; jaws subequal, the lower very slightly protruding; lips thin; teeth simple, in a narrow band on each jaw, outer ones but little enlarged; tongue broader anteriorly, truncated in front; gill-openings not extending far forward; isthmus broad, its width equal to the length of snout; gill-rakers rudimentary, represented by a few minute, fleshy protuberances; nostrils widely separated, anterior nostril covered with a fleshy flap, situated near the tip of snout, the posterior approximated to eye, round with no cover.

Dorsals separate, spinous dorsal when depressed reaching beyond the insertion of soft dorsal, tip of each spine filamentous, third spine the longest, soft dorsal rather high, last ray reaching beyond the root of caudal; anal inserted below base of second dorsal ray, the rays a little shorter than those of dorsal, when depressed reaching almost as far posteriorly as do those of soft dorsal; caudal and pectorals sharply rounded posteriorly, the latter reaching a vertical through last dorsal spine; ventrals united, extending as far posteriorly as do pectorals, not reaching the vent.

Head except occiput naked; body with uniform, conspicuous scales, those on nape small, breast anterior to ventrals almost naked.

Color in alcohol grayish above, paler below, back maculated with black, sides with about ten dark V-shaped cross bands, angle of which directing backward; top of head maculated, a dark triangular blotch below the eye reaching behind the angle of mouth; a dark brown spot at the upper part of the pectoral base; spinous dorsal with two series of dusky longitudinal band, spines spotted with black; soft dorsal dusky, with four series of longitudinal band of pale gray color; pectorals and caudal grayish; ventrals dusky; anal membrane dark gray.

Total length 104 mm.

Described from a specimen from the Kachek river near Kachek.  
Habitat: The Kachek River, Hainan.

Remarks: The present species is very closely related to *Rhingobius sexfasciatus* from Madras, India, differing from it in the length of head and depth of body.

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52. *Rhinogobius giurinus* (Rutter)

Five specimens from the Kachek River near Kachek.

*Boleophthalmus* Cuv. et Val.

53. *Boleophthalmus chinensis* (Osbeck).

A single specimen from Haiho (total length 76 mm.).

Head 3,90 in length ; depth 6,2 ; D. 5,25 ; A. 25 ; P. 19 ; V. 1,5 ; snout 3,75 in head ; eye 5,35 ; depth of caudal peduncle 2,67.

Tail, below the soft dorsal, with three more or less indistinct cross bands, descending obliquely forward, forming three dark spots on the base of soft dorsal ; one more cross band at the base of caudal ; spinous dorsal densely dotted with bluish ; soft dorsal uniformly dark gray with no white spots.

Coloration of the present example differs slightly from the description by Günther (Cat. Fish. 3, p. 103).